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Brief Report Article

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Entiere Identities Between Ophiocomina Nigra Igkappa Gene and Human Immunoglobulin Kappa Locus. New Aspects of Invertebrate Igkappa Genes (Ipa).

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Abstract

Entire identities between Invertebrate Ophiocomina nigra IGKappa gene and Human IGK gene are confirmed, in the present work, at the level of immunoglobulin domains (constant and variable).

Keywords: IGKappa; Ophiocomina

Abbreviations: DNA: Deoxyribonucleic acid, RNA: Ribonucleic acid.

Introduction:

The transcriptome of the Ophuirid: Ophiocomina nigra IGKappa gene was discovered recently **[1]**. Since it was synthesized de novo and cloned in a pUC-GW-Kan plasmid **[2]** which was a gift of Bo Huang laboratories. The original sequence of the IGKappa gene, after cloning, was the following in 5'-3':

Original sequence:

GAGGAACTGCTCAGTTAGGACCCAGACGGAACCAT
GGAAGCCCCAGCGCAGCTTCTCTTCCTCCTGCTACT
CTGGCTCCCAGATACCACTGGAGAAATAGTGATGA
CGCAGTCTCCAGCCACCCTGTCTGTGTCTCCAGGGG
AAAGAGCCACCCTCTCCTGCAGGGCCAGTCAGAGT
GTTACCAGCAACTTAGCCTGGTACCAGCAGACACC
TGGGCAGTCTCCCAGGCTCGTCATCTATGGTGCATC
CAGCAGGGCCAGTGGTGTCCCAGCCAGGTTCAGTG
GCAGTGGGTCTGGGACAGAGTTCACTCTCACCATC
AGCAGCCTGCAGTCTGAAGATTTTGCAGTTTATTAC
TGTCAGCAGTATAATAAGTGGCCGCACACTTTTGG
CCAGGGGACCAAGCTGGACATCAAACGAACTGTGG
CTGCACCATCTGTCTTCATCTTCCCGCCATCTGATG
AGCAGTTGAAATCTGGAACTGCCTCTGTTGTGTGCC
TGCTGAATAACTTCTATCCCAGGGAGGCCAAAGTA
CAGTGGAAGGTGGATAACGCCCTCCAATCGGGTAA
CTCCCAGGAGAGTGTCACAGAGCAGGACAGCAAG
GACAGCACCTACAGCCTCAGCAGCACCCTGACGCT
GAGCAAAGCAGACTACGAGAAACACAAAGTCTAC
GCCTGCGAAGTCACCCATCAGGGCCTGAGCTCGCC
CGTCACAAAGAGCTTCAACAGGGGAGAGTGTTAGA
GGGAGAAGTGCCCCCACCTGCTCCTCAGTTCCAGC
CTGACCCCCTCCCATCCTTTGGCCTCTGACCCTTTTT
CCACAGGGGACCTACCCCTATTGCGGTCCTCCAGCT
CATCTTTCACCTCACCCCCCTCCTCCTCCTTGGCTTT
AATTATGCTAATGTTGGAGGAGAATGAATAAATAA
AGTGAATCTTTGCAAAAAAAAAAAAAAAAAAAAA
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

The original gene, the original protein issued from this last one share total identity with Homo sapiens immunoglobulin kappa locus, mRNA (cDNA clone MGC:22645 IMAGE:4700961): they have a complete identity **(Figure1)**.

The Sequence of the concerned gene is ID: BC030813.1

At last, the Protein GenBank **[3]** has the following number: AAH30813.1 with 234 amino acids as shown below:

MEAPAQLLFLLLLWLPDTTGEIVMTQSPATLSVSPGE
RATLSCRASQSVTSNLAWYQQTPGQSPRLVIYGASSR
ASGVPARFSGSGSGTEFTLTISSLQSEDFAVYYCQQYN
KWPHTFGQGTKLDIKRTVAAPSVFIFPPSDEQLKSGTA
SVVCLLNNFYPREAKVQW
KVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKAD
YEKHKVYACEVTHQGLSSPVTKSFNRGEC

It is shown, for the first time, that an invertebrate IGKappa gene shares entiere identity with a human immunoglobulin **(Figure1)**.

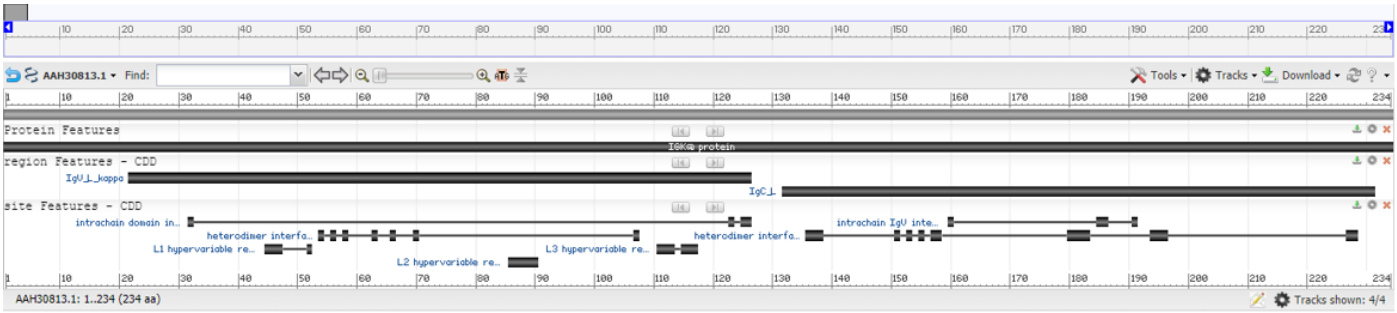

Figure 1: IGK@ protein [Homo sapiens] graphic (in dark) by NCBI shares IG domains with Ophiocomina nigra IGKappa protein (in grey) issued from ophuirid IGKappa gene. (link)

GenBank: AAH30813.1 protein issued from IGK gene has two immunoglobulin domains:

1. Region 1

Region: IgV_L_kappa

Comment: Immunoglobulin (Ig) light chain, kappa type, Variable (V) domain

Location: 22…126

Length 105 aa

2. Region 2

Region: IgC_L

Comment: Immunoglobulin constant domain

Location: 132…231

Length 100 aa

References:

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2. Leclerc M (2021) Submission Imlet. Immunol Lett.

3. Hutchinson AT, Jones DR, Winter PM, Tangye SG, Raison RL (2014) Cell membrane associated free kappa light chains are found on a subset of tonsil and in vitro-derived plasmablasts. Hum Immunol 75(9): 986-990.